

**AGILE BASED DEVELOPMENT METHODOLOGY FOR
MOBILE COMMERCE APPLICATIONS**

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Abstrak

Terdapat beberapa metodologi pembangunan sistem termasuk kaedah tradisional dan tangkas yang digunakan dalam pembangunan sistem semasa. Walau bagaimanapun, ia boleh dikatakan bahawa metodologi yang sedia ada mungkin tidak sesuai untuk pembangunan aplikasi perdagangan mudah alih. Aplikasi ini digunakan dalam konteks yang berbeza dari aplikasi konvensional e-dagang tetap seperti paparan pada peranti skrin yang kecil, persekitaran yang tidak stabil atau yang dipindah-pindahkan dan keperluan kepada aspek keselamatan untuk menyampaikan transaksi kewangan melalui rangkaian mudah alih. Penyelidikan ini bertujuan untuk membina metodologi pembangunan berasaskan tangkas bagi aplikasi perdagangan mudah alih. Untuk mencapai matlamat ini, tiga objektif telah dicadangkan termasuk mengenal pasti amalan yang penting untuk membangunkan aplikasi m-dagang, pembinaan metodologi yang boleh diramal berasaskan tangkas yang digunakan untuk membangunkan aplikasi m-dagang dan penilaian untuk kesesuaian dan praktikaliti. Kaedah penyelidikan yang digunakan ialah reka bentuk penyelidikan, termasuk langkah-langkah kesedaran masalah, cadangan, pembangunan, penilaian dan kesimpulan. Kaedah penyelidikan yang digunakan untuk membantu penyelidikan metodologi yang disebutkan termasuklah analisis literatur, lawatan industri, temu bual separa struktur, kajian, penyelidikan formatif dan penilaian eksperimen. Kaedah dibina mengandungi integrasi faktor penting dalam setiap fasa kitar hayat sistem pembangunan serta garis panduan untuk diikuti bagi menjalankan aktiviti-aktiviti dalam pembangunan aplikasi, termasuk model khusus, alat dan teknik. Dari penilaian kaedah yang dibina, keputusan menunjukkan dua perkara yang penting. Pertama, metodologi yang dibina boleh diaplikasikan dan digunakan untuk membina sistem yang dicadangkan, dan dalam kes ini aplikasi perdagangan mudah alih. Kedua, dari segi praktikalitinya, ia menunjukkan bahawa metodologi yang dibina ini adalah praktikal apabila dibandingkan dengan metodologi *the traditional waterfall development* dengan menggunakan sebelas ukuran tertentu, di mana didapati ia memberi lebih banyak faedah kepada proses pembangunan.

Kata kunci: Perdagangan mudah alih, Pengkomputeran mudah alih, Aplikasi mudah alih, Sistem metodologi pembangunan, Pembangunan tangkas

Abstract

There are several system development methodologies including traditional and agile methodologies which are being utilized in current systems development. However, it could be argued that existing methodologies may not be suitable for the development of mobile commerce applications as these applications are utilized in different contexts from conventional fixed e-commerce applications such as they are displayed on a small screen device, they are utilized in an unstable or movable environment and they need to be used in a secured environment to deliver financial transactions over mobile network. This study aimed to construct an agile based development methodology for mobile commerce applications. In order to achieve this aim, three objectives have been proposed including identification of essential issues for developing m-commerce applications, construction of a predictable agile based methodology used for developing m-commerce applications and evaluation for its applicability and practicality. The research methodology used in the study is the design research, which include the steps of awareness of problems, suggestion, development, evaluation and conclusion. The research methods used to assist the mentioned research methodology include literature analysis, industry visits, semi-structured interview, survey, formulative research and experimental evaluation. The methodology constructed contains the integration of essential factors in each phase of systems development life cycle as well as guidelines to follow for conducting activities in the application development, including specific models, tools, and techniques. From the evaluation of the constructed methodology, the results showed two essential outcomes. Firstly, the constructed methodology is applicable as it can be used to build the intended system, mobile commerce applications in this case. Secondly, for practicality, it showed that the constructed methodology is practical as when comparing to the traditional waterfall development by using the eleven measurements specified, it exposed more benefits to the development process.

Keywords: Mobile commerce, Mobile computing, Mobile applications, Systems development methodology, Agile development

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List of Abbreviations

3G	3rd Generation Mobile Network
ASD	Adaptive Software Development
B2B	Business to Business
B2C	Business to Consumer
BV	Business Value
CAS	Complex Adaptive Systems
CDC	Connected Device Configuration
CDP	Customer Decision Process
CLDC	Connected Limited Device Configuration
CRC	Class, Responsibilities, and Collaboration
DBMS	Database Management System
DFD	Dataflow Diagram
DSDM	Dynamic System Development Method
EC	Electronic Commerce
ECVM	E-commerce Value Matrix
EDGE	Enhanced Data rates for GSM Evolution
ERD	Entity Relationship Diagram
FDD	Feature-Driven Development
G/Q/M	Goal/Questions/Metrics
GPRS	General Packet Radio Service
GUI	Graphical User Interface
HCI	Human Computer Interaction
HCSDLC	Human-Centered Systems Development Methodology
HTML	Hypertext Mark-up Language
HTTP	Hypertext Transport Protocol
IDE	Integrated Development Environment
J2EE	Java2 Enterprise Edition
J2ME	Java2 Micro Edition
M-commerce	Mobile Commerce
MIDP	Mobile Information Device Profile
MLM	Multi Level Marketing
MS	Microsoft

PC	Personal Computer
PDA	Personal Digital Assistant
PV	Point Value
R&D	Research and Development
RAD	Rapid Application Development
RMS	Record Management System
RUP	Rational Unified Process
SA&D	Systems Analysis & Design
SDLC	Systems Development Life Cycle
SEI	Software Engineering Institute
SMS	Short Message Service
UI	User Interface
UML	Unified Modelling Language
VCC	Virtual Value Chain
VMD	Visual Mobile Designer
WAP	Wireless Application Protocol
WML	Wireless Mark-up Language
WSA	Web Services Architecture
XP	Extreme Programming
ZFR	Zero-feature Release

CHAPTER ONE

INTRODUCTION

1.1 Background

Mobile commerce or commonly known as m-commerce, typically designates the use of wireless devices (particularly mobile phones) to conduct electronic business transactions, such as product ordering, fund transfer, and stock trading, (Kalakota & Robinson, 2002). According to Liang, Huang, Yeh, and Lin (2007), m-commerce refers to any transactions, either direct or indirect, via mobile devices, such as phones or Personal Digital Assistants (PDAs). While many different definitions of m-commerce exist in the literature (Turel & Yuan, 2006), these usually refer to e-commerce activities conducted through mobile devices such as mobile phones and Personal Digital Assistants (PDAs).

Liang *et al.* (2007) stated that the most significant features of mobile technology are mobility which is the state of being in motion and portability which is the ability to be carried or moved easily. It is therefore essential for m-commerce application developers to develop applications carefully to conform to the significant features of m-commerce as mentioned, which are mobility and portability. Some prominent examples of m-commerce include mobile financial services (e.g. m-banking, m-payment, and m-brokering), mobile shopping (e.g. m-retailing, m-auctions), mobile entertainment (e.g. m-gaming, m-music, m-video, and m-betting), and mobile information (e.g. mobile access to sports news, weather forecasts, maps, and so on.) (Khalifa & Shen, 2008).

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